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FIGHTING INSECTS WITHIN OUR BORDERS

A radio talk by C. L. Marlatt, Chief, Bureau of Entomology, delivered through WRC and 39 other radio stations associated with the National Broadcasting Company, December 12, 1930.

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By no means are all insects harmful or destructive. Many are beneficial and others are sources of useful products, as honey, silk, dyes and lac. Very large groups also render notable aid as parasites and predators on other insects, important as pests. In the public mind, however, the first consideration is given to insects in their role as crop destroyers. The losses caused by such pests to the various crops, to forests and forest products, and in injury to man and animals are conservatively estimated at two billion dollars a year.

The Bureau of Entomology of the United States Department of Agriculture is concerned with insects in all their economic relations but with the major object of prevention or minimizing losses occasioned by harmful insects. The work of the Bureau covers, by Division, the important classes of farm crops, such as fruits, cereals, forage crops, truck crops, tobacco, and cotton, and also insects destructive to forest and injurious to man and animals as parasites or as concerned with the transmission of diseases.

To give you a more intimate picture of the work against harmful insects, I propose in this talk to present a few of the high lights of the work of the Bureau for the past season.

In the field of deciduous fruits--apple, pear, peach, etc.--as an example of many different projects I will take only the Oriental fruit worm. This recently introduced pest has become a very serious menace to the peach and other fruits. It was brought to this country about 1911-12 along with importations of the flowering cherry of Japan. Such importations gave it firm foothold in and surrounding the District of Columbia and around New York City, and also scattering throughout the Mississippi Valley. The losses to the peach growers from this pest last year reached several million dollars. As a result of earnest requests from such growers, particularly from the important peach district of southern Indiana, Congress granted a considerable appropriation to be used for a demonstration of a trapping method which had been indicated as useful in the earlier work of the Bureau. During the past season, we carried out two large-scale experiments with the use of many thousands of traps. One experiment was in southern Indiana, one in northern Georgia. Each covered approximately 500 acres of orchards. The traps were baited with poisoned fruit juices attractive to the moths. This first season's work indicated benefit but fell short of the full significance hoped for due to the exceptional drought of last summer and to winter killing of peach trees as to Indiana. We propose to continue and conclude this trapping experiment next summer. As an additional means of orchard control, we began collections of foreign parasites in Europe during the year 1929. Native parasites are also beginning to attack the eggs and larvae of the fruit moth, some 50 of which have been studied--and one of these is now so abundant

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in infested orchards in New Jersey that it is being there collected for distribution in other States. Intensive research with poisons and similar means of control is also being vigorously pushed.

The Mediterranean fruit fly is the outstanding subject in the field of citrus and other subtropical fruits. It will be recalled that this most feared of all fruit pests was found to have obtained wide foothold in Florida in the spring of last year. Most of you know of the effort, which seems now to be successful, to eradicate this pest--an effort which has cost upwards of \$6,000,000. The determination of the means for such eradication, by bait sprays for the flies, by safe disposal of infested fruit, and by the development of methods of sterilizing fruit, has been the work of the Bureau of Entomology.

In the Division of Truck Crop Insects, the subject of perhaps the widest interest at the present time is the Mexican bean beetle, which fifty years ago or more had worked up from Mexico into the Southwestern United States and in recent years appeared in Alabama and Georgia, and now has crossed the Eastern United States into Canada. In addition to commercial growers of beans, millions of persons having small gardens in the eastern United States are now altogether too familiar with this new and very destructive pest. Spraying with magnesium arsenate seems to be the best control, and later when the beans are in pod dusting with Pyrethrum compound. You may be encouraged to know that a parasite of this beetle has been found in its original home in Mexico and efforts are being made for its colonization in the United States.

In the field of forest insects many projects and stations are distributed in important forest sections for the study of destructive pests. Outstanding among such pests are the Western bark beetles, which in the Pacific Northwest now occasion losses of from fifteen to twenty million dollars annually. These beetles have a habit of building up in particular trees and the following year spreading from these widely throughout the adjacent forest. The control is to discover by expert scouting such trees and then to take steps to prevent their being a source of spread. In addition to the research as to remedies for these beetles, the Bureau is doing a large amount of service work in the scouting and determination of the trees to be treated in both privately owned forests and in National Forests and National Parks.

In the field of Cereal and Forage Insects the European corn borer is still the outstanding pest. It will be recalled that this is the \$10,000,000 insect--at least nearly that amount was expended a few years ago in an effort to demonstrate to some three million farmers the possibility of control of this new enemy by reasonable adjustments of farm practices. Such controls are the outcome of the work of this Bureau. The importation of parasites of the corn borer from European countries has been continued actively for several years. During the past year over 600,000 parasites of 17 different kinds were distributed in infested areas. While the damage by the corn borer to the corn crop of the United States remains practically negligible, individual instances of heavy damage over limited areas can be pointed out, and it would seem clear that its menace to the corn crop of the Nation is such as to fully warrant intensive study of all possible means of control by parasites, by farm methods, and by the direct applications of poisons, as well as continued control under quarantine restrictions to prevent spread.

The outstanding cotton insect in the United States continues to be the Mexican boll weevil. But cotton is threatened by another and perhaps equally dangerous pest known as the pink bollworm--an insect which reached the United States from India via Egypt and Mexico. It would take too long to tell you the story of the eradication of this pest some ten or twelve years ago over great areas in Eastern Texas and in Louisiana, and of conditions which have led to its maintenance along the Rio Grande in West Texas and its recent outbreak in the important cotton production area of the Salt River Valley, Arizona. Here again the Bureau of Entomology is concerned with the methods of controlling this pest. An important parasite of this cotton worm has been reported from Kenya Colony, East Africa, and steps are now being taken to secure this parasite for colonization in the United States and Mexico.

Insects affecting man and animals cover an enormous range of subjects--certain household pests and direct parasites of both man and animals,--even the reindeer in Alaska,--also the many insects which are concerned in the conveying of diseases, as to man, malaria, yellow fever, spotted fever, etc., and to animals, the tick fever of the South and others. There is no time to enter into this field but it may be of interest to point out an extraordinary use of insects in surgery which has been developed in the last few years by Dr. William Baer of Johns Hopkins University. From experiences in the World War Dr. Baer discovered that the maggots of the common blow flies introduced into bone lesions produced cures in the most obstinate cases. The Bureau of Entomology has been drawn into cooperation in this field of work to study the means by which suitable fly larvae can be kept available under sanitary conditions for use in hospitals or in private practice. Curiously enough it now develops that this same method is not new as thought but was actually in occasional use by surgeons some half-century ago.

The subject of stored product insects affects every housewife. It includes the real moths and various insects which attack many kinds of foods, or act otherwise as pests in homes. The outstanding development of the year in this field was the discovery during the summer that the larvae of a common stored product moth, normally attacking food articles, was severely injuring tobacco in five important warehouses near Richmond, Virginia. Naturally great excitement in tobacco circles resulted and an immediate investigation was requested. The depredator proved to be a cosmopolitan species occurring widely in the United States but not hitherto considered an important stored product pest. An examination of foreign records indicated two earlier instances of injury to tobacco by this pest, one in Russia, 1915, and the other in London last year. This, therefore, is a new type of injury and the investigation of remedies has only just begun. The importance of this pest is indicated by the fact that the tobacco concerned in this outbreak had a value in excess of \$9,000,000, and normally several hundred million dollars' worth of tobacco is held in storage.

I have discussed eight representative projects out of several hundred under work in the Bureau either in Washington or distributed among some 113 field stations located in 36 States. Important work is going on also in Alaska, Hawaii, and the Canal Zone, and in some seven foreign countries--the latter chiefly concerned with the collection and introduction of useful parasites.

As to benefits, Dr. A. F. Woods, Director of Research in the Department of Agriculture, after careful study, has recently estimated the annual saving in the field of applied entomology at \$330,000,000. Certainly without the determinations of pest control developed by the Department of Agriculture and other agencies, important crops would receive vastly greater injury than now, and many types of fruits and vegetables could not be produced with profit.